

Date: Wed, 19 Oct 94 04:30:18 PDT
From: Ham-Homebrew Mailing List and Newsgroup <ham-homebrew@ucsd.edu>
Errors-To: Ham-Homebrew-Errors@UCSD.Edu
Reply-To: Ham-Homebrew@UCSD.Edu
Precedence: List
Subject: Ham-Homebrew Digest V94 #308
To: Ham-Homebrew

Ham-Homebrew Digest Wed, 19 Oct 94 Volume 94 : Issue 308

Today's Topics:

 Getting on 2.4 Gigahertz
 Looking for MPF102 replacement
 Microwave oven leakage?
 Ramsey 40 meter coverage??? (2 msgs)
 Range of cordless phones?
 Screen Voltage Protection Circuit
 tuning circuit
 VLF Antenna Design

Send Replies or notes for publication to: <Ham-Homebrew@UCSD.Edu>
Send subscription requests to: <Ham-Homebrew-REQUEST@UCSD.Edu>
Problems you can't solve otherwise to brian@ucsd.edu.

Archives of past issues of the Ham-Homebrew Digest are available
(by FTP only) from UCSD.Edu in directory "mailarchives/ham-homebrew".

We trust that readers are intelligent enough to realize that all text
herein consists of personal comments and does not represent the official
policies or positions of any party. Your mileage may vary. So there.

Date: Tue, 18 Oct 1994 15:56:58 GMT
From: drp@netcom.com (Randy Petersen)
Subject: Getting on 2.4 Gigahertz

Newsgroups: rec.radio.amateur.homebrew
Subject: Getting on 2.4 Gigahertz
Distribution: usa
Organization: NETCOM On-line Communication Services (408 261-4700 guest)

I have been looking into getting equipment or building some
equipment to operate on 2.4 gig in the Santa Clara Valley.
(San Jose Calif Area). I have been looking for the best ie
cheapest way to get on 2.4 gig. I have a 1.2 gig HT and some
other equipment. I have been looking at swap meets and such
but have not found anything that I can use. I am posting this

so that some MicroWave type Elmer out there might have some wisdom to share. There are 2 or 3 2.4 gig repeaters groups and I am talking with them also. I am a software and digital electronics type so RF and especially MicroWave is new to me. Any help would be appreciated.

Randy Petersen
drp@netcom.com
KE6IZZ

Date: 18 Oct 1994 05:19:33 GMT
From: hskim@ripley.ece.uiuc.edu (Han Kim)
Subject: Looking for MPF102 replacement

Dana Myers (myers@Cypress.West.Sun.Com) wrote:

> The Motorola data sheet for the J310/U310 suggests that 1.5dB is the typical
> NF at 450MHz for a J310, and the available gain is certainly in excess
> of 11dB. I skimmed the data sheets for other Motorola RF MOSFETs; none of
> them had a lower NF than the J310, though several of them were specified
> as sporting higher gain. The simple fact is, you don't necessarily want too
> much gain in a pre-amp; afterall, what good is a pre-amp that makes your
> radio overload and generate intermod in the front end?

Good point. I would certainly go for higher dynamic range than higher gain for my receiver design; but when I switch in a pre-amp, I really _switch_ in. Sometimes one really could use extra couple of dB, but it's not usually the case when all you listen to is FM repeaters. Sometimes having too much gain hurts rather than helps.

> >If you have to buy something new, then I say go for a GaAsFET. There are
> >several types you can get for less than 5 buck a piece. A GaAsFET has
> >much better NF especially at 440. The handbook has several plans on this,
> >too.

> GaAsFETs can certainly offer excellent performance, but aren't exactly
> cheap and are generally a little less rugged than JFETs. Frankly, in
> the real terrestrial FM world, a super gain/super low noise preamp is
> probably not as much of an advantage as it is in the small-signal (EME,
> etc.) world. You can build a J310 based preamp for 450MHz that offers
> a healthy +13dB of gain with a +19dBm intercept and a noise figure
> under 2dB quite cheaply (under 50 cents for the J310). When the next
> electrical storm rolls through, your JFET will probably still be
> working afterwards, and only costs \$.50 to replace if it fails :-)

Right again. GaAsFETs are not cheap. But that doesn't mean that you

cannot afford one; sometimes I have to spend extra couple of bucks for a superior performance. We have to spend extra \$5 when we need 20dB more gain and to keep receiver NF under 3dB. (The overall NF of a receiver is mostly determined by the NF of the first stage.) But then again, this may not be a typical requirement. For most 2m and 70cm application, the J310 would be a good choice.

> I personally think people get too hung up on gain, sensitivity and
> noise figure specifications without considering the gain and noise
> distribution in a receiver, and also the environment the receiver is
> operated in. This is how we get .1uV receivers that crunch at the
> slightest provocation.

Yes. It is of no use, in general, to build a receiver with 5dB of overall NF in HF, as well as one with -150 dBm of minimum discernible input. But there might be someone who really need such things, however improbable. Sometimes it helps to know what other ways are there. I wonder if suggesting alternatives would offend the original poster or others.

> The original question was "what is a good replacement for the
> MPF102?". If the answer is constrained to JFETs, the J310 is probably
> the best answer in terms of price, availability and performance. It is
> in the same TO-92 package as the MPF102 and offers superior performance,
> in most cases with minimal circuit adjustment.

It has been answered, and answered well.

> ---

> * Dana H. Myers KK6JQ, DoD#: j | Views expressed here are *
> * (310) 348-6043 | mine and do not necessarily *
> * Dana.Myers@West.Sun.Com | reflect those of my employer *
> * "Antenna waves be burnin' up my radio" -- ZZ Top *

Han..

--

Han Seok Kim | hskim@uiwpl.s.ece.uiuc.edu
Wave Propagation Lab. | (217) 333 - 4406
Univ. of Illinois at Urbana-Champaign | Linux - to die for

Date: 18 Oct 1994 14:38:15 GMT
From: gbelton@rs1.tcs.tulane.edu (Gerald A Belton)
Subject: Microwave oven leakage?

Mike Shales (shales@hookup.net) wrote:
: Sorry, this is an out of left field question, but...

: Is there a simple circuit/device that will show leakage around
: a microwave oven? If so I'd like a reference or description :-)

Saw one at Wal-mart last night. It's a plastic card the size of a credit card, with an LCD strip along one edge. The instructions say to move it around the door of the oven for a specified amount of time while the oven is on, and it displays a Good/Bad reading. Cost about six dollars.

--

"What a strange person. I don't speak
Is there anyone else up there we can talk to?" for Tulane.

Date: Tue, 18 Oct 1994 14:27:08 GMT
From: geertj@ripe.net (Geert Jan de Groot)
Subject: Ramsey 40 meter coverage???

>In article 17hu@yuma.ACNS.ColoState.EDU, greendot@lamar.ColoState.EDU (Robert Taylor) writes:

>> Hello I have an electronics project that i need to build. I want to build a
>> 40 meter CW transmitter. The only one that i can find is in the ramsey cat
>> alog, but it says that the coverage is 7.040 MHz and can be tuned to 7KHz
>> around the XTAL frequency. I'm not familiar with the 40 meter but if I'm
>> reading my info correctly for a techpluss operator I am allowed privileges
>> on 7100 to 7150 KHz. If my math and info are correct this will not work
>> for me! Any suggestions?
>> Thanks Robert (KB0PED)

Check out the books 'Solid state basics' and 'solid state design'.
(don't know if the first one is still available).
Both will allow you to learn what you need and build your
equipment while still having a fighting chance to make it work,
and know how to fix it if it doesn't.

It will be fun!

Don't know about US regulations though.

73 Geert Jan PE1HZG

Date: Tue, 18 Oct 1994 08:27:34 -0800
From: bkehr@garnet.berkeley.edu (Bob Kehr)

Subject: Ramsey 40 meter coverage???

In article <37vqm6\$17hu@yuma.ACNS.ColoState.EDU>,
greendot@lamar.ColoState.EDU (Robert Taylor) wrote:

> Hello I have an electronics project that i need to build. I want to build a
> 40 meter CW transmitter. The only one that i can find is in the ramsey cat
> alog, but it says that the coverage is 7.040 MHz and can be tuned to 7KHz
> around the XTAL frequency. I'm not familiar with the 40 meter but if I'm
> reading my info correctly for a techpluss operator I am allowed privilages
> on 7100 to 7150 KHz. If my math and info are correct this will not work
> for me! Any suggestions?
> Thanks Robert (KB0PED)

for another source of a 40m cw kit, you might try the northern california
qrp club (norcal). right now they are taking orders for their norcal-40.
if you want more info, send me mail and i'll try to get it for you.

bob (ka9mdp)

Date: Tue, 18 Oct 1994 14:54:53 GMT
From: byrne_mike@mm.ssd.lmsc.lockheed.com (mgb)
Subject: Range of cordless phones?

In article <1994Oct16.092248.1@ccvax6.ccs.csus.edu>,
la_tests@ccvax6.ccs.csus.edu wrote:

> Hello everybody, I am new to this news group, however I am very
> interested in Amatuer radio and electronics. I have had a few classes
> and they have peaked my interest. I would like some advice though. I
> would like to know if there are any particular books out there on
> radio that describe cordless phones. Further, if anybody could give
> me advice on how to make my cordless phone perform better (longer range)
> I would appreciate.
>
> You can E-mail me at ROMAND@CSUS.EDU
>
> Thanks for any help or advice that you can give....
>
> Dean Roman

Suggest you send an E-mail to "info@arrl.org" to get information on what
resources are available from the Amateur Radio Relay League, the national
ham organization in the US. Ham publications do not address cordless
phones directly, but antenna principals would apply.

Date: 18 Oct 1994 20:40:09 -0400
From: ells22@aol.com (ELLS22)
Subject: Screen Voltage Protection Circuit

In article <19940ct16.020953.23722@ke4zv.atl.ga.us>, gary@ke4zv.atl.ga.us
(Gary Coffman) writes:

Gary, thanks for the ideas. I thought about using part of the plate capacity for the screen. At 750 volts, 100ma it must be regulated and then I have the problem of what happens when the plate voltage goes and the power supply has to bleed down the 5KV plate voltage from a 50microfarad cap. I don't know if the reaction time is fast enough to save the tube. Do you have any info on that?

Thanks again de WA6CWV, Russ in Boise.

Date: 18 Oct 1994 11:47:27 GMT
From: moritz@ipers1.e-technik.uni-stuttgart.de ()
Subject: tuning circuit

>I'm experimenting with a simple 'crystal radio circuit': coil in parallel with
>a tuning cap from an am radio, germanium diode, lm2904 opamp.

Mike,

I am afraid you are grossly underestimating the requirements for a amateur band receiver, and even for simple AM broadcast reception. If you can get hold of the integrated AM receiver ZN414 or a description thereof, you might learn what can be done with a simple detector receiver.

An amateur band RX *requires* a local oscillator, for ssb or cw detection. you find simple "direct conversion" receivers in the ARRL Handbook.

Good luck and success with future projects, Moritz DL5UH

Date: 18 Oct 94 16:11:30 GMT
From: ka7oei@uugate.wa7slg.ampr.ORG
Subject: VLF Antenna Design

I have "dabbled" with LF/VLF numerous times in the past... and built a number of antennas.

One of the best antennas that I built for this purpose was a shielded loop... This consisted, quite simply, of a loop, about 3 feet in diameter, constructed of CATV hardline. The bottom end was open with the shield grounded at both ends, and at the top, there was a gap in the shield ONLY. There is a sort-of drawing (note that it is square, since those are easier to draw...)

```

i-----l_l-----i
li-----il
lil-----l-l-----lil
lil                                     lil
lil                                     lil
lil                                     lil
lil                                     lil
lil                                     lil
lil                                     lil
lil                                     lil
lil                                     lil
lil                                     lil
lil                                     lil
lil                                     lil
lil                                     lil
lil          l-----l          lil
lil-----l          l-----lil
li-----XX-----il
i-----l_____l-----l

```

It may be a bit hard to see (I'm not very good at ASCII "art") but there is a gap in the shield at the top, but the shield is connected at the bottom. The "XX" in the box is the RF amplifier/transformation circuit.

The one I built, again, used CATV hardline with a slot carefully sawed in the shield at the top, using some kludged compression fittings at the bottom on an aluminum case. I also built one using copper tubing (it was easier) and in that case, I was able to more easily mount it at the bottom using the readily-available compression water fittings.

The XX circuit could be any number of things, but one thing that DOES work relatively well is just a simply audio transformer of the 8-ohm type. (Yeah, like the one they sell at radio shack...) The 8 ohm side goes on the loop, and the other side connects to a common-gate FET preamplifier. Depending on frequency, etc, I experimented with the centertap on the audio transformer for best signal.

I built this loop and it worked well even into the AM broadcast band (the transformer itself is "OK" - not great - to over 100 KHz). On this single-turn loop, you can often broadly resonate the loop with some capacitors. It may take several 10's of nanofarads to do it at 100 KHz, and maybe several microfarads farther down (hint: use a huge pile of mylar caps... electrolytics really suck rocks for this...) A friend of mine use the copper-pipe loop (did I mention the single conductor of wire in the pipe?) and resonated

a multi-turn secondary.

The trick is, with an H-field loop, is to keep the shielding in good shape. The one that I built with copper ('never tried it with the aluminum coax version...) I could null out a local 50kw AM station. You can't do that if the antenna happens to respond to E-field, as well, so you have to make sure things are in a shielded enclosure.

One thing is sure: with a single-turn loop, the ONLY good way to match the impedance of the loop element itself to any practical amplifier circuit is with a transformer. This is because the impedance of the loop can be a small fraction of an ohm at these frequencies...

One word about E-field whips: I have a decent E-field whip and it works very well... provided that you are NOWHERE NEAR a powerline... Its frequency response extends into the KHz region (if I place it near an audio line, like one leg of a speaker wire...) I can hear what is being carried if I have the output of the antenna connected to a high-gain audio amp... but the OMEGA signals will drive you bananas, too...) If you are 'bent on building one of these, I would consult one of the several articles written in the past by Ralph Burhans that have appeared in 73 Magazine. HE knows of what he speaks! Again, they DO work well, but in urban environments, expect to hear a lot of noise... unless you are lucky... and no-one is using a light-dimmer in your neighborhood... Even then, you could use a synchronous noise-blanker, but thats another story...

<Clint>

ka7oei@uugate.wa7slg.ampr.org

Date: 18 Oct 1994 12:35:01 GMT

From: vhansen@ipfy.bau-verm.uni-karlsruhe.de (Wolfgang von Hansen)

References<37oolb\$9k2@nz12.rz.uni-karlsruhe.de>

<1994Oct16.183956.27000@ke4zv.atl.ga.us>, <MONTA.94Oct17001540@pixel.mit.edu>

Subject: Omega (was: Re: Q: VLF antenna design)

In article <MONTA.94Oct17001540@pixel.mit.edu> monta@pixel.mit.edu (Peter Monta) writes:

>gary@ke4zv.atl.ga.us (Gary Coffman) writes:

>

>> > [VLF antenna, 10--14 kHz]

>

>It sounds like he wants an Omega antenna, from the frequencies.

Yes, you got it. I didn't want to use the word Omega in my first posting

because I was afraid to get less answers to such a specific question.

But as it seems that some people here heard of Omega before, I will ask the question in another way:

Who can tell me how to build an Omega antenna?

Wolfgang

--

```
vhansen@ipf.bau-verm.uni-karlsruhe.de | Gurus use `cat >a.out' instead of gcc
float o=0.075,h=1.5,T,r,0,l,I;int _,L=80,s=3200;main(){for(;s%L||
(h-=o,T= -2),s;4 -(r=0*0)<(l=I*I)|++ _==L&&putchar(*((--s%L?_<L?--_
%6:6:7)+"World! \n"))&&(0=I=l=_=r=0,T+=o /2))0=I*2*0+h,I=l+T-r;}
```

End of Ham-Homebrew Digest V94 #308
